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Claims

1. A method for controlling the operation of an HCCI internal combustion engine which can be operated in the HCCI operating mode or in an operating mode using externally applied (spark) ignition and during normal operation in a predefined switchover method is switched between said operating modes as a function of predefined operating parameters, characterized in that, irrespective of the predefined switchover method, operation of the internal combustion engine (1) in the HCCI operating mode is prevented if at least one of the following exceptional situations occurs:
  - a) the vacuum in a vacuum reservoir (15) of an associated braking system (13) is less than a limit value due to an excessively high pressure in the intake duct (2) of the internal combustion engine (1);
  - b) the scavenge rate of a fuel tank venting valve (14) of an associated fuel tank venting system (13) of the internal combustion engine (1) is less than a limit value;
  - c) the temperature of the coolant of a cooling circuit (19) of the internal combustion engine (1) is less than a minimum value;
  - d) the measurement of the air mass and/or the pressure in the intake duct (2) of the internal combustion engine (1) is defective;

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- e) the ignition of the air-fuel mixture and/or the fuel injection is defective;
  - f) misfires or extremely uneven running of the internal combustion engine (1) occur;
  - g) a safety device (21) for monitoring the control functions of the internal combustion engine (1) detects a system error.
2. The method as claimed in claim 1, characterized in that the internal combustion engine (1), if it is being operated in the HCCI operating mode and at least one of the events a) to g) occurs, will be switched over to an operating mode using externally applied (spark) ignition.
3. A method for controlling the operation of an HCCI internal combustion engine which can be operated in the HCCI operating mode or in an operating mode using externally applied (spark) ignition and during normal operation in a predefined switchover method is switched between said operating modes as a function of predefined operating parameters, characterized in that, irrespective of the predefined switchover method, operation of the internal combustion engine (1) in the HCCI operating mode is enforced if at least one of the following exceptional situations occurs:
- a) the recirculation rate of an external exhaust gas recirculation system of the internal combustion engine (1) is greater than a limit value as a result of a malfunction;

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- b) the air-fuel ratio ( $\lambda$ ) is less than 1 in spite of the fuel injection being switched off.